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Nathan S. Kline

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THE ALTERATION OF "NATURAL" BIOLOGICAL STATES BY LSD

By NATHAN S. KLINE*

THE history of LSD-25 is indeed a curious one. The story begins with the fact that there is a purple fungus (*Claviceps purpurea*) which grows upon rye and other grains. This parasite is widespread throughout both Europe and North America. Rye destined for commercial sale in the United States is inspected to make sure that there is not more than 0.3 percent of infected grain. In dry years less than 1 percent of the grain crop is rejected for this reason, but in other years the percent of infection has been as high as 36 percent. The active ingredient in this fungus is called ergot, which is itself a mixture. Several pharmaceutical agents which can be extracted from this fungus serve a great variety of medical functions, ranging from contracting the uterus (to induce labor), the relief of migraine and the treatment of certain diseases of the blood vessels.

As early as 600 B.C. an Assyrian tablet makes reference to a "noxious pustule in the ear of grain." In a sacred book of the Parsees (400 to 300 B.C.) there is the passage: "Among the evil things created by Angro Maynes are noxious grasses that cause pregnant women to drop the womb and die in childbed."

Goodman and Gilman¹ also point out that the ancient Greeks and the early Romans did not eat rye, and hence the parasite was not introduced into Southwest Europe until the beginning of the Christian era. The first descriptions in our own literature of ergot poisoning do not occur until the Middle Ages. These epidemics were probably associated with wet years in which the fungus was particularly prevalent. Undoubtedly some of the "visitations" which resulted in gangrene of the feet, legs, hands and arms were the result of such ergot poisoning. Some of the dancing manias and other psychological abnormalities may also be related. Frequently the effect on blood vessels was such that the tissue became dry and black, and the mummified limbs separated without loss of blood. Because of the charcoal-like appearance and the severe burning sensations, the patients were said to have been victims of St. Anthony's (or Holy)

* M.D. Director of Research, Research Center of the New York State Department of Mental Hygiene, Rockland State Hospital, Orangeburg, New York. President, American College of Neuropsychopharmacology.

¹ L. GOODMAN & A. GILMAN, *THE PHARMACOLOGICAL BASIS OF THERAPEUTICS* (3d ed. 1965).

fire. The reason the disorder was named after St. Anthony was that if the victims traveled to St. Anthony's Shrine early enough and stayed there long enough they were relieved of the disease (probably because they stopped eating bread or cereal made from the infected grain).

Finally in 1670 ergot was identified as the cause of these epidemics; but despite this knowledge there have been repeated recurrences even until recent times—*e.g.*, Russia in 1926, Ireland in 1929 and France in 1953.

As early as 1582 there is reference to ergot as a proven means of inducing labor although it was used by midwives long before that date. It was really not until the beginning of the 19th Century that the medical profession generally adopted its use. Its primary medical indication today is for the prevention of postpartum hemorrhage.

The pharmaceutical industry, in its search to obtain more purified and more effective substances, spent a great deal of time and money in trying to purify this mixture in order to isolate in pure form the various alkaloids mixed in ergot so that their action could be standardized to be safer and more consistent in action. The first such alkaloid was discovered by A. Stoll in 1918, but it required 33 years after its discovery until the very complicated structural formula of this substance, ergotamine, was proposed in 1951. It then required another 10 years until ergotamine could be totally synthesized by Albert Hofmann and his coworkers in 1961. The totally synthetic product was in every respect identical with the natural product, and confirmed the formula which had been proposed 10 years earlier.

Both Hofmann and Stoll worked at Sandoz Pharmaceuticals in Basel, Switzerland. The discovery of LSD grew directly out of the work of Stoll and Hofmann on ergot. The common nucleus of all the ergot alkaloids turned out to be lysergic acid, which was isolated in 1934. Once this had been obtained, it was possible to prepare a series of semisynthetic derivatives by making various modifications or additions to the original natural nucleus. In 1938 Stoll and Hofmann synthesized a whole series of such substances. Number 25 in this series was D-lysergic acid diethylamide which was given the laboratory designation LSD-25. Some of the biological experiments carried out were described in a report submitted in March 1943, which showed that the drug had some action on the uterus, which of course was not unexpected. In addition, however, it produced great excitation and a cataleptic condition in some of the experimental animals. In April of 1943 Hofmann, while working with this substance, reported the following in his laboratory notes:

Last Friday, 16 April, I was forced to stop my laboratory work in the middle of the afternoon and to go home, as I was overcome by a peculiar restlessness associated with mild dizziness. Having reached

home, I lay down and sank into a kind of delirium which was not unpleasant and which was characterized by extreme activity of the imagination. As I lay in a dazed condition with my eyes closed (I experienced daylight as disagreeably bright) there surged in upon me an uninterrupted stream of fantastic images of extraordinary vividness and accompanied by an intense, kaleidoscope-like play of colors. The condition gradually passed off after about two hours.²

It subsequently has become evident that because of the extreme potency of LSD-25 (possibly the most potent substance known to man in respect to the great effect produced by the very minute quantity), the fumes which Hofmann inhaled were sufficient to produce the reaction. Hofmann suspected that it might have been the LSD-25, although he had not intentionally ingested any. In order to investigate the problem he decided to experiment on himself, but in order to be absolutely safe, he started with a dose which he assumed would be well below any effective threshold of action. Based on the potency of other substances obtained from ergot, the 0.25 mg. should have been without activity. Hofmann planned to increase the dose gradually until he obtained some reaction, but instead actually took an amount about five to 10 times the dose required to produce disturbances in the majority of normal persons. Hence the reaction which occurred was truly spectacular. Forty minutes after swallowing the drug, Hofmann reported "slight dizziness, unrest, difficulty in concentration, visual disturbances and a marked desire to laugh." The laboratory note stopped abruptly at this point. Later Hofmann noted:

The last words could only be written with great difficulty. I asked my laboratory assistant to accompany me home as I believed that my condition would be a repetition of the disturbance of the previous Friday. While we were still cycling home, however, it became clear that the symptoms were more marked than the first time. I had great difficulty in speaking coherently, my field of vision swayed before me, and objects appeared distorted like images in curved mirrors. I had the impression of being unable to move from the spot, although my assistant told me afterwards that we had cycled at a good pace. . . . By the time the doctor had arrived the peak of the crisis had already passed. As far as I remember, the following were the most outstanding symptoms: vertigo, visual disturbances; the faces of those around me appeared as grotesque, colored masks; marked motor unrest, alternating with pareses; and intermittent heavy feeling in the head, limbs and the entire body, as if they were filled with metal; cramps in the leg, coldness and loss of feeling in the hands; a metallic taste on the tongue; dry constricted sensation in the throat; feeling of choking; confusion alternating with clear recognition of my condition, in which state I sometimes observed, in the manner of an independent, neutral observer, that I shouted half insanelly or babbled incoherent words. . . . The doctor found a rather weak pulse but an otherwise normal circulation. Six hours after ingestion of the LSD-25 my condition had already improved considerably. Only the visual disturbances were still pronounced. Everything seemed to sway and

² *The History of LSD-25*, 2 SANDOZ J. MEDICAL SCIENCE 117-24 (1955).

the proportions were distorted like the reflections in the surface of moving water. Moreover, all objects appeared in unpleasant, constantly changing colors, the predominant shades being sickly green and blue. When I closed my eyes, an unending series of colorful, very realistic images surged in upon me. A remarkable feature was the acoustic perceptions (e.g., the noise of a passing car) were transformed into optical effects, every sound causing a corresponding colored hallucination, constantly changing in shape and color like a kaleidoscope.³

Holmstedt & Liljestrand⁴ point out that in 1947 W. A. Stoll (the son of the chemist A. Stoll who had done the original ergot investigations) reported results obtained with LSD-25 in the course of a pioneer study made at the Psychiatric Clinic of Zurich University. His description of the clinical picture of acute intoxication with LSD-25 in normal and schizophrenic subjects was so complete that only minor amendments have since been necessary.

In one of the most remarkable episodes in the history of pharmaceutical manufacturing, Sandoz Pharmaceuticals, since the discovery of LSD-25 in its laboratory 30 years ago, continued to supply the drug to many investigators throughout the world without cost and sometimes provided them with financial assistance to carry out investigations to supplement all the work done in their own laboratories. This was done in spite of the fact that it became obvious fairly early that the drug would be most unlikely to have any commercial application. Despite the fact that LSD was never manufactured by Sandoz in the United States there were continual rumors to the contrary and it was unjustly assumed that somehow or other Sandoz was responsible for all of the LSD in use. Although Sandoz did hold a patent on the drug, it was so easily reproduced that the sources of supply were multiple. For many years it was required that an investigator using the drug must have support from the National Institute of Mental Health, Veterans' Administration or a state commissioner of mental hygiene, which enabled Sandoz to limit and screen those wishing to investigate the drug to fully qualified, approved physicians.

Because of the vastly unfavorable publicity concerning the drug, Sandoz discontinued all its investigations but turned over the remaining supplies to the National Institute of Mental Health for it to administer and dispense. A joint committee was set up with the Food and Drug Administration to supervise legitimate distribution of the product to qualified scientists.

However, illicit means of production and distribution of LSD continue to be the most important problem facing the legal community with respect to the drug. It is this illegal, uncontrolled use to which the remainder of this article is directed.

³ *Id.*

⁴ B. HOLMSTEDT & G. LILJESTRAND, READINGS IN PHARMACOLOGY (1963).

Medico-Legal Problems of LSD

LSD use has proliferated with great rapidity, in part because of the ease of producing it with rudimentary equipment and elementary information. More importantly, LSD advocates promote its use with religious fervor because of the spiritual values claimed for its purported mind-expanding properties. Some controls are needed because of potential dangers to users, to future offspring, to those with whom the user comes into contact and to society. Legislation is more apt to be effective if we better understand today's transitional moral climate, the crisis of values and the neurotic (hysterical) disassociation between beliefs, behavior and reality.

Attitudes toward a variety of products which alter "natural" biological states show great variations between different segments of society. The same disassociated attitude is found not only in the dissenting minority but in the dominant cultural attitude and even at times is manifest in the legal and medical professions.

Against this broad background the special problems of LSD are considered as they seem relevant to crime, negligence and sanity. Instead of, or in addition to, sanctions it is proposed that for a variety of enumerated reasons the possible or demonstrated LSD user be given protective custody until it can be determined by examination and/or management that the danger to others from his LSD usage has at least been minimized.

Some differences between legal and medical attitudes and a few of the reasons that account for the differences

A lawyer may attempt to persuade a client to follow a certain course, but it is not common practice for him to abandon a case if his client refuses to comply with his decisions. In contrast, the physician is accustomed to having his orders accepted almost without question, and it is common practice that if a patient refuses to accept recommendations that the physician resign from the case and insist that the patient find another doctor.

The difference between the customs of the two leading professions are unquestionably governed in part by the immediacy and dispatch with which decisions must be made in most medical matters. As a consequence of the system the physician is much more involved in personal responsibility and his personal liability is much greater. Thus the physician's attitude toward drugs which cause deviations in "natural" biological states are apt to be different from those of the lawyer. If a patient is taking a drug which is harmful to him the physician feels he has a right to terminate its use whether this does or does not infringe on the patient's personal rights. Similarly

he is apt to insist that indicated medication be given whether it does or does not offend "legal niceties" which he often tends to ignore.

Countering this authoritarian, conservative medical attitude is the fact that the practice of medicine itself is basically an empirical act, not overly concerned with remote precedent, and in general favorably disposed toward experimentation and change. The physician is therefore almost exclusively concerned with *what* a drug does, the lawyer with *who* does it and *how* it is done, while society passes value judgments based on *why* it is done.

The influence of the cultural setting on the attitudes of medicine, the law and society in general

At any period there are apt to be transitions in attitudes and this is certainly true in respect to the use of drugs in our own society today. The introduction of the coffee bean into Arabia is reputed to have occasioned rebellion amongst the ordinarily passive Moslem women because the men found the drink so stimulating that they stayed up in conversation almost all night. Morphine at the time of its discovery was held to be a completely safe "penny panacea." When cocaine was first introduced into Europe it was regarded as a harmless stimulant and was freely snuffed at concerts and theaters in order to heighten the sense of enjoyment. Anesthesia of any sort was fanatically resisted at first by "religious" groups on the ground that by biblical injunction women were meant to suffer during childbirth and that relief of pain was, in any case, "unnatural." Thus some drugs which were readily accepted (cocaine) subsequently turned out to be extremely dangerous, while others which were strongly resisted (anesthetics) eventually proved to be great boons to humanity.

The present state of man and his society encourages the use of drugs such as LSD

Man's basic need for action

Man as an animal is impelled by internal forces to act. Thinking and feeling developed as adjuncts to more efficient acting. Just what form that action will take depends on the sensations experienced, the learned modifications of innate response patterns, and the possible alternatives existing in the immediate environmental situation. Behavior based on purely rational decision, if it exists at all, is certainly rare.

Sensual, emotional or even motor needs evoke activity

Each of us is continuously being teased, hoodwinked, wheedled,

threatened, bluffed, seduced or assaulted. When such blandishments or provocations to action are at the cognitive or even the emotional level we can guard ourselves by being aware. However, often under-riding are appeals to primitive sensations involving incense, drums, ritualistic postures, idols, and pageantry. Rhythmic sounds and motions are interspersed with abrupt syncopes; extended or closed repetitive designs, color shock and most of all, patterned movement. Elusive, lingering, attractive, unidentifiable odors attract us or stench stir some troubled layer that lies below consciousness. The body itself—the skin with its prickling and itching, hotness and coldness never really leaves us alone; the muscles fidget or ache and there are vague internal stirrings, appetites, “all the nameless feelings that course through our breast.”⁵ Finally, there is the mind’s own place, eternally restless, seeking, peeking, poking, probing. Quiet and silence is a kind of death, from which we fear we may never be able to rouse ourselves.

The role of drugs in altering perception: The partial dependence of such responses on environment and expectation

Evocation and certainly control of these response patterns is still largely “unscientific.” Experience and a particular habit of mind are necessary, however, before experience can be decocted into an effective guide through these mazes. Fatigue, hyperexcitement and particularly drugs, by producing dissociation, tend both to heighten such experiences but at the same time to break down sophisticated self-awareness. The loss of ego integrity with its capacity for reality testing leaves the self wide and uncritically open to prior expectations and environmental influences. How the drug-induced perceptual, kinesthetic or other distortions will be interpreted will therefore vary from culture to culture and even from individual to individual. Depending on circumstances the same drug may induce profound depression, Dionysian ecstasy, terror or bland indifference. Yet if we induce similar expectations and control environment, the response is usually predictable.

Society’s moral attitude

Whether such para-universes lead to improved philosophic or psychologic insights is far from clear. The use of drugs for anything other than medical therapeutic purposes has always been construed as a threat—even when the purpose was ostensibly religious. Few except the in-group would sanction such use.

Even at the most simple level there is confusion; “taking drugs”

⁵ M. ARNOLD, *The Buried Life*, in POEMS 283 (1886).

has an immoral connotation despite the fact that the particular drug may be life saving; there is only disapproval of escape from intolerable thoughts, feelings or situations. At times drugs serve to induce actions which would otherwise not be possible; the hope of ex-static (i.e., out of the status quo) movement leads some men to seize upon whatever is at hand to try to bring about such alterations. "The desire to take pills" wrote Olser, "is the greatest feature which distinguishes man from the animals."

Why the increased interest and use of drugs at this time and place in history?

To varying degrees each of us mortgages the present for the future; we tolerate present discomfort in expectation of eventual relief or even reward. Those parts of the remembered past which make us queasy are usually justified as contributing to some useful purpose yet to be realized. In the process we create a cultural as well as a personal history involving the whence and hence of existence.

On rare and glorious occasions some individual or group floods through time with an epic tide and in sheer admiration we are all swept along. More frequently the individual narrative thread is thin and frayed. In place of the grand patterned fabric we see only the thrums of existence. The whole business becomes a "drag." "Bugged" by what we trail along and "hung up" on what is yet to come, we seek temporary or semipermanent escapes.

Today we lack any viable universally accepted dramatic plot. The success (not the failure) of 19th century rationalism has left us at least momentarily without a denouement. Not that those dated objectives of adequate food, housing and racial equality for everyone have been attained but, as in the stock market, their achievement has been "discounted" since it is obvious that within another few hundred years they will be substantially achieved. The sense of great purpose and broad adventure which these goals engendered has vanished. Instead of singing down the high road we are looking at our sore feet. It requires solid stupidity, bland carelessness or extraordinary courage to disregard signposts which say "To Nowhere." The road is studded with squatters who block those who would pass. The gatherings at the campfires are not for counsels or imaginative planning but to titillate with pointless ghost stories.

Curiosity and action are thus directed inward. Drugs that help sever the tenuous ties with the outside world become highly prized since they both assist and justify the disregard for external realities.

In the search for new values to give rise to a new narrative the towering, probing mystics of the past have sought to recapture the

UR-experience upon which every Establishment originally drew strength until it became formalized. This invariably demanded the shattering of the idols or the escape from the Concept. Visions, iconoclasm, transcendence took place as the inevitable realization of a whole life's agon. Smashing a few clay figures or experiencing visual hallucinations does not produce an Abraham or a St. Theresa. Every great mystic has had experiences dissociated from the time and culture in which he lived—but the dissociation arose out of inner necessity. Conversion in turn is facilitated by the ecstasy of dance, ritual death, drugs. Dissociation per se has no value and can become meaningful only as it is integrated into a conceptual framework. This incorporation can be strongly directed from outside.

The dissociation can also produce panic if the attempt is made to retain dissolving ego controls. Once these are surrendered a para-infantile acceptance of the universe is experienced in which there are no clear ego boundaries so that the One-ness with the All comes about. Whether this feeling (or any other) has important value depends entirely on how it alters the organization and action of the organism.

A categorization of drugs and the attitudes of various groups in respect to their use

In any society there are forces pushing and pulling at cross purpose. We rarely make or need laws when everyone is in agreement. To understand better from whence the pressures arise respecting LSD we should also examine other agents as well. Hence it is instructive to:

- (1) Itemize some of those "drugs" which alter natural physiological states;
- (2) Divide them according to whether their usage is
 - a. encouraged.
 - b. permitted.
 - c. regarded indifferently.
 - d. limited.
 - e. banned.
- (3) Since various segments of a society may differ in respect to such attitudes, the drugs are cross catalogued as to the segment of society involved:
 - a. legal.
 - b. medical.
 - c. dominant cultural.
 - d. dissenting minority.

These are contained in the table on the following page.

Table I
Attitudes Toward Certain Chemical Agents Which Alter
the "Natural" State

Agents	Segment of Society			
	legal	medical	dominant cultural	Dissenting minority
nonpsychootropic				
deodorants	0	+	++	0
toothpaste	0	++	++	0
dental fluoridation (t)	+—	++	+	—
vitamins	+	—	++	0
laxatives, synthetic	+	—	+	—
laxatives, natural (e.g. prunes)	0	+	++	++
aspirin	+	—	++	—
antihistamines	—	—	+	0
antibiotics	++	—	+	—
psychootropic				
cigarettes (nicotine) (t)	+	—	++	—
alcohol	—	—	++	—
anesthetics	++	++	+	—
cyanide/arsenic	—	—	—	+
"tranquilizers"	—	—	+	—
sedatives	—	—	+—	—
hypnotics (for sleep)	—	—	+	—
stimulants	—	—	—	+
narcotics	—	—	—	+
marijuana (t)	—	+—	—	++
LSD	—	—	—	++

++ encouraged
 + permitted
 0 indifferent
 — limited

— banned or opposed
 +— mixed
 (t) transitional

Discussion of attitudes towards certain chemical agents which alter the "natural" state

Nonpsychotropic (not directly affecting thoughts, feeling or behavior)

Deodorants and toothpaste

Society is strongly approving of deodorants and toothpaste whereas the medical profession endorses toothpaste on hygienic grounds and has no objections to most of the currently marketed deodorants. There is a dissenting minority of persons who deliberately disregard unpleasant breath and body odors. The law, on the other hand, is relatively indifferent.

Dental fluoridation

Fluoridation for prevention of dental decay carries a strong endorsement of the medical profession as a whole, is more or less passively permitted by the dominant culture and violently opposed by a dissenting minority who have been potent enough to produce a mixed response on the legal side as to whether this enforcement of a health procedure invades privacy or otherwise offends the law.

Vitamins

Whereas the dominant culture is quite enthused about vitamin-taking, the physicians as a group believe that limitations should be placed on their use. The law has permitted their over-the-counter sale. There is no wildly dissenting minority opposed to vitamin usage.

Laxatives (synthetic and natural)

The dominant cultural attitude toward prunes and similar "natural" laxatives is a most approving one and the medical profession has no objection to their usage. The law is silent on the subject and the "dissenting" minority in this case is even more enthusiastic than the dominant culture.

The attitude toward synthetic laxatives (or even derived ones such as cascara) is general approval by the culture which appears to believe that a daily bowel movement is a requirement of good health. There is a dissenting minority strongly against synthetic laxatives and the medical profession feels that their use should be definitely restricted. The law has given approval to over-the-counter sale.

Aspirin

There is enough aspirin sold in the country for every man, woman and child over the age of 15 to have an aspirin tablet every day of his life and two on Sundays. The medical profession again would restrict usage to where it is strongly indicated, and there is a small

dissenting minority which is opposed to the use of aspirin. Again the law permits over-the-counter sale.

Antihistamines

While certain types of antihistamines can be sold over the counter, others are restricted in their usage so that the law has taken a mildly limiting stand. The medical profession would probably prefer even stricter limitation, whereas the dominant culture approves of the use of such agents for colds, allergies and other ills of mankind. As with deodorants, toothpaste, and vitamins there is no group either violently opposed to or in favor of these agents.

Antibiotics

Whereas the sale of these drugs is definitely restricted by law, there have been precedents in which the law has insisted that these drugs be regarded as live-saving and given to children, for instance, despite the objection of their parents. Obviously the medical profession has no hesitations about when and where to use them but approves of the position that their sales should be restricted. In general the dominant culture approves and permits of their usage despite a small but fanatical dissenting minority.

Summary

The dominant culture either permits or encourages the use of some nonpsychotropic chemical agents. In general the minority groups are either indifferent or opposed to such "physical" drug usage. The medical profession would limit the use of most of these agents except those concerned with general cleanliness or the prevention as opposed to the treatment of pathological conditions. Thus vitamins would be approved if there were not a sufficient supply of them in the diet, and fluoridation is generally supported. The other agents it is felt should be limited to cases where they are indicated. The law permits freer use of some of these agents than either the medical profession or the dominant culture would recommend.

Psychotropic Agents

Quite a different situation arises in respect to psychotropic agents. The most common attitude of the dominant culture is to oppose their use with a few notable exceptions. In contrast there is a dissenting minority which would advocate use of these drugs for a variety of purposes or at least permit their free usage. With only one real exception the law has limited or banned their usage, and except for two agents (cigarettes and marijuana) which are in transition, the law and the medical profession find themselves in agreement.

Cigarettes

Although the dominant culture continues to support cigarette smoking, the medical conclusions (as opposed to the personal preferences of the doctors) would be to ban the use of an agent for which there is strong evidence of etiological factors in cancer and heart disease. In this case the dissenting minority will probably eventually become the dominant view. The law as yet has placed no real limitation on cigarette usage.

Alcohol

In contrast to the status of cigarettes the law has placed definite limitations on the use of alcohol even though it is also approved by the dominant culture. The medical profession would probably limit usage more than is done at present, and a dissenting minority would prefer to eliminate its usage entirely.

Anesthetics

Again there are cases in which anesthetics have been ordered by the court despite objections of the supposedly responsible individuals. The medical profession obviously holds that they should not be sold freely, but is strongly for their use as opposed to that of a dissenting minority. The dominant culture as a whole permits but would not insist upon such usage.

Cyanide/Arsenic

These drugs when used for the purpose of suicide or murder are unanimously rejected by the legal, the medical and the dominant cultural opinion. There is a dissenting minority which would hold that if an individual were to use these drugs for self-destruction that it would be the individual's own concern. Presumably when used for purposes of murder even the dissenting minority disappears.

"Tranquilizers"

Although somewhat opposed a few years ago, the shift is definite enough to indicate that the dominant cultural attitude is now one of permission for the treatment of such conditions as schizophrenia, depressions and other serious psychiatric disorders. The dissenting minority in this case oddly includes some psychoanalysts and other psychotherapists who feel that these agents only interfere with really "curative" treatment. Both the law and medical profession would place limitations on such drug usage.

Sedatives

Drugs such as Miltown, Equanil, Librium, Valium, Serax which are used primarily as sedatives are regarded by the dominant culture

with a much more ambivalent attitude. There is no really strong objection but rather acknowledgment of their widespread use and mild disapprobation. Again a dissenting minority would have such drugs banned, and both the law and medical profession insist upon limitations.

Hypnotics

Agents to produce sleep are more favorably regarded by the dominant culture. The dissenting minority and the law and medical profession take the same attitude as they do toward sedatives and tranquilizers.

Stimulants

The stimulants have evoked an extremely strong and negative response from the dominant culture which would probably place more restraints on their use than would the law and medical profession. There is a dissenting minority which would permit them to be taken ad lib.

Narcotics

The same attitude of marked disapprobation is held by the dominant culture in respect to opium and its derivatives, cocaine and other narcotics, whereas a milder view on limitation is held by the law and medical profession. Even the use of narcotics in extreme pain is not regarded without mixed concern by the dominant culture.

Marijuana

The attitude toward marijuana is very much in transition, and although in general banned by the dominant culture and by legal restrictions the medical opinion as to its dangers are in some conflict. There is a fairly sizeable dissenting minority which would encourage or at least permit its use.

LSD

The dominant legal, medical and cultural opinions would ban its use in contrast to a very verbal dissenting minority. The status of LSD will be discussed in more detail below.

Factors influencing attitudes toward drugs

The factors which influence attitude toward the drugs differ for each of the groups. Those factors of dominant importance to the medical profession are whether the drugs are:

- a. life saving.
- b. life destroying.
 1. of self.

- 2. of others.
- c. pain relieving.
 - 1. physical.
 - 2. psychic.
- d. subject to drug abuse.
 - 1. addicting.
 - 2. dependency developing.
- e. capable of inducing dissociation.

Those which save life and relieve pain without producing deleterious or disproportionate side effects or sequelae are regarded favorably. Claims for the usefulness of LSD in psychotherapy are open to considerable question, and certainly there seems to be no reason to believe that the same results might not have been accomplished by other means even if the time involved was somewhat longer. There are only three therapeutic areas of investigation in which there exists even the possibility that LSD may serve a function which could not otherwise be achieved. One of these is in the treatment of psychopathic personalities, the second in the treatment of otherwise unresponsive alcoholics and finally in providing relief to some of the dying who are thrown into panic and terror by the experience. The value of LSD in these regions has been by no means demonstrated but there at least seems to be some justification to determine whether it does or does not serve a function. Thus on strictly medical grounds the banning of the drug would cause no great loss.

The stage is thus apparently set for rejection of LSD but many of us sense that the solution is not that simple. It is necessary to go far deeper in our analysis of the problem than the simple "do's" and "don'ts" of LSD usage.

We are in a "late sensate" period in which sensation is valued for its own sake. Nonrepresentational art is devoid of "meaningful" content and is justified by the visual pleasure it produces. Much music lacks coherent form; theater of the absurd and plotless novels with antiheroes are fully acceptable. It is argued that since LSD (and a few related drugs) produce sensations not otherwise obtainable their effects should be experienced. To those who deplore such permissiveness the LSD convert can expound glibly on the use of the drug in finding new values by expanding consciousness to new limits. The failure of this approach is a basic one since values arise from comprehending experience and not simply experiencing sensations.

The insecurity of most of us arises because of the contradictions and inadequacies of our own beliefs which we feel should be able to deal fully and systematically with the universe in which we find our-

selves. The extent of our dilemma is such that we even find ourselves irrationally attracted to the Epimetheans of yesteryear—the ultra-conservators of beliefs we have outgrown, rejected or never held. If we are tempted to align ourselves with the forces of repression and restriction (knowing we do not really believe) in order simply to obtain emotional relief, then perhaps those whom we oppose *are* truly Prometheans who are leading the way into the future and we ought to defend their right to go where they please even though we ourselves might not wish to take the trip with them. Can it be that the advocated abandonment of reason is the direction of the future?

The very extent and nature of the dilemma provides a clue to its solution. We are not forced to choose between irrational extremes nor need we sit by idly and helplessly. New paths of reflection and action are opened to us by recognizing that both extremes are wrong and that for the present we must tolerate conflict while working out the necessary evaluation, resolution or revolution. To damp the small flickering light of reason in order to be bathed in emotional sensual gratification is too expensive and too dangerous no matter how great our need of relief. Paradoxically, each century, each decade, the risks become greater because of our increasing competence in producing superior methods of physical and psychological control. Nerve gases used to control riots can be used to disrupt the controllers. Today the media of mass communication is extending itself from news to beliefs and hence to the setting of values because we insist upon being told not only the facts but what they ought to mean and what we ought to do about them.

Change and uncertainty must be accepted as conditions of existence. The very knowledge that there are problems which we cannot at present totally or satisfactorily resolve opens up whole new avenues of approach. Instead of seeking ultimate decisions we become aware that it may be years in some cases or centuries in others before our information is likely to be complete enough to draw sensible conclusions. Recognition that we must suspend or make only tentative judgments will prevent us from acting on irreversible decisions made at one of the extremes of an oscillation. Despite the cries of the radical right and left, of neo-stoicism and neo-hedonism it is obligatory that we shift to a new frame of reference if we are to survive. If it is *not* essential that we reach a statutory decision then it is essential that we *not* reach a statutory decision.

Hence any proposed legal solutions or resolutions should be so flexibly formulated that they can be altered in the light of new knowledge and new circumstances.

Information about the possible deleterious effects of LSD on chromosomes is presently under active investigation. At the time of

this writing the evidence is that although a variety of substances cause damage to the chromosomes, the spontaneous recovery which usually takes place after a short time is greatly delayed or fails to occur at all in some cases following LSD. LSD thus involves an element of danger to the user. Many of the usual avenues of demonstrating individual courage have been blocked or regarded by those attracted to LSD as unacceptable for one or another reason. In addition to the physical risk there is a very real danger of producing a prolonged or permanent psychotic state. This need to "prove" oneself most often occurs in adolescence or among the emotionally unstable, the prepsychotic and the psychopathic. The user of LSD is ipso facto suspect and his mental state (even without LSD) may be such as to make him dangerous to himself or others.

LSD not only enhances the probability of such breakdown of an emotionally ill person but is capable of inducing psychotic behavior in otherwise normal individuals. Frequently there is a splitting of mental and emotional activity into compartments which produces a separateness that makes integrated activity impossible. Often LSD also produces visual distortions and hallucinations.

In addition to the dangers which the chromosomal damage, the precipitation of psychosis, the dissociation and the hallucinations and delusions produce for the LSD user himself, these effects also endanger the lives of others. This is not true of most other drugs and hence a sharp separation should be made between LSD and other substances such as marijuana, opiates and alcohol. For one thing these other drugs are not known to produce chromosomal changes with consequent dangers of phocomelia (absence of limbs such as produced by Thalidomide) or other teratogenic effects (gross birth abnormalities). Thus there exists a real danger to the foetus if the mother is in early pregnancy or even to children who may be conceived subsequently. We are still investigating whether LSD use by males enhances the probability of abnormal sperm and of abnormal offspring. In addition to the damage to the child there is both psychological and often financial damage to the husband (or wife).

By deliberately risking a psychotic breakdown the LSD user also imposes the risk of psychological and financial damage to those who will have to support him.

There is a real threat to family, friends or even complete strangers because of the unpredictable effects of LSD in producing dissociation. We all have thoughts, feelings and impulses which if not restrained would result in murder, mayhem, rape and numerous other antisocial acts. When an individual is dissociated in the manner which LSD may produce he is capable of acting out behavior which he would otherwise repress or reject since normal restraints are absent. It is

characteristic of such dissociation that the LSD user is unaware of the fact that he is so dissociated.

Similarly the perceptual distortions which LSD produces are not accompanied by the same awareness as the alcoholic or narcotic addict has that he is under the influence of some agent which makes his behavior abnormal. Since objects often appear to change their shapes, driving an auto under the influence of LSD is a violently dangerous sport. One of my patients produced a rubric closer to the truth than the usual *League for Spiritual Discovery* when he offered instead *Lets Seek Death*.

To make matters worse the effects of LSD may wear off or be terminated by an antidote only to recur hours or days later without the awareness of the subject that he is in the throes of a relapse. The apparent reality of the perceptual distortions are well illustrated in the following transcript of the LSD experience of a world famous medical professor who was aware that he was under the influence of the drug. Had there been a subsequent recurrence the intellectual awareness that the experience was unreal might have been lacking since it "felt real" to him.

- L. I seem to be in three to four different dimensions all at once.
I don't like it.
- K. You don't like it.
- L. No.
- K. Why not? Do things fade in and out?
- L. They do. My whole self, feet, hands and everything.
. . . hallucinations. I know it is an hallucination.
- K. How do you know it is an hallucination?
- L. I know God damn well it is. I am trying to report to you at the same time. The background, the voices, the sound, the vision. Your'e recording this, I hope.
- K. I hope so.
- L. Because things are away in the background; then come clearer all the time.
- K. Does that make them unreal?
- L. Yes. My whole feeling. My legs feel unreal. At times nothing seems real at all.
- K. Does it resemble a dream experience?
- L. Yes, but I have not had anything like this. Things seem to be in all six or seven dimensions. I seem to have seven feet, seven legs.
- K. Uh huh.
- L. I see you are laughing at this. This is a reality because you recognize that I am crazy.
- K. Is it more pleasant now?
- L. It is.
- K. What do you think makes the difference?
- L. God damn if I know.
- K. I suspect it is because I am the one person who is reasonably familiar to you.
- L. At first I thought what you were saying was real.
- K. Now, what's the matter?

- L. It's weird. I am glad you are back. Jesus Christ, Nate, this is really something. It is just that I am cold, I guess. Everything seems like, still does, transparent jelly. Put your hands through anything.
- K. What happened? You are trying?
- L. God damn it, right now it is melting into wax. Curious thing—I can hear you in front of my ears and now I can see my flesh turning inside out into all sorts of contortions.
- K. What is it doing?
- L. The veins and the tendons here are weaving in and out like . . . This is crazy. You know it is crazy but the whole thing is coming in and out all the time. Weird sensations of space. Sometimes you are nowhere at all.
- K. Would you say the primary distortions are in the visual or kinesthetic or in the auditory areas?
- L. You know I am still not with you. You know that. Right now it is all the visual. No embodiment to anything. And the mass of molten jelly like a great big jelly fish out in the whole world. In cosmos. It is black, ebony. Has a pleasant color, texture. Like shiny, sinuous ebony. All of a sudden I come back. God damn it. I don't like this.
- K. You don't?
- L. No.
- K. All right.
- L. At times I do.
- K. You fluctuate between liking it and not.
- L. I am bright enough to know it is supposed to do this.
- K. You can't control it. Can't make it stop.
- L. I try to. I grab the chair.
- K. You can't make it stop. Hold on. No?
- L. No, no. All of a sudden my whole hand and fingers get small and turn orange. Come back and forth. It is weird.
- K. We ought to let you try painting again and see what that fish you painted looks like this time.
- L. Let me try it. Let me try it.
- K. Does the fish look differently now?
- L. Yes. It sort of opens and closes and gets bigger and smaller; it changes contour up and down and the dimensions both vertically and horizontally. All three dimensions, there seem to be more than three dimensions.
- K. What are the other dimensions?
- L. Something intangible, as if many little wires, cobwebs. Seem to be stringing down from my fingers. Getting smaller and smaller, wafting more and more off in the distance. Now I am getting dizzy. Everything is floating around and a noise in the back of the head. Very shaky now. Can see little things.
- K. On the paper?
- L. Yeah.
- K. What are little things on paper?
- L. Little ants.
- K. Ants. O.K. What color?
- L. You're not going to talk me into this one.
- K. It's you who are telling me. You're trying to talk me into them. I don't see them.
- L. A little orange and yellow ones. Very small.
- K. Moving?

- L. You're God damn right they are moving.
K. How many of them roughly?
L. Thousands of these little things; thousands. All different dimensions like a combination of Salvador Dali and Madame de Silva. That's very good. Different dimensions. Now I am seeing things in colors—dimensions.
K. Why don't you paint away and see how the fish is doing?
L. When I look at the damn fish. I am very disappointed in the fish.
K. You are? Well to hell with the fish then. If you look at it maybe it will change.
L. No, the fish keeps going in and out, up and down, this and that way.
K. How can it when it doesn't?
L. Occasionally it's spots go this and that way. Third Avenue, cheap.
K. Why don't I take this off and let you start another fish? Do you take this off with a knife?
L. All right. I have a pen knife here but I don't trust myself with it. Don't know where the hell I am.

Factors influencing legal opinion

It is risky for a physician to attempt to draw conclusions about legal factors in respect to LSD. I summarize here the annotations and comments of the legal opinions expressed in Appendix B of the Task Force Report on Narcotics and Drug Abuse of the President's Commission on Law Enforcement and Administration of Justice⁶ which states that if it is shown that the use of LSD is demonstrated to be sufficiently dangerous some criminal sanctions against users may be warranted. The author of the report feels that the time is not appropriate to enact legislation prohibiting either use or possession because:

1. It is not clear how often the dangerous effects of the drug occur.
2. It is the belief of the Food and Drug Administration that it can control LSD by enforcement of trafficking offenses, including the possession prohibition of the Federal law, and by seizure.
3. Possession as an offense would make irrelevant proof that it was intended for later distribution.
4. If possession were a crime, a principal avenue by which the FDA traces sources of LSD might be at least partially blocked, because some persons suffering adverse reactions might not seek medical assistance if they were subject to a possession charge.

If additional legislation were needed it could take the form of a

⁶ Rosenthal, *Proposal for Dangerous Drug Legislation*, in PRESIDENT'S COMMISSION ON LAW ENFORCEMENT AND ADMINISTRATION OF JUSTICE, TASK FORCE REPORT: NARCOTICS AND DRUG ABUSE, APPENDIX B 109 (1967).

civil violation with a sanction other than interference with personal liberty. Congress should enact legislation making inapplicable the present exemption from criminal liability of possession of the LSD if it is intended for use of a member of the household. Any controlled drug which the Secretary of Health, Education, and Welfare designates should be so regarded. It is believed that this course should be followed because the FDA is better equipped to assess the extent of medical use of the drug than is Congress.

Aside from special circumstances which threaten minors and other legally noncompetent individuals, the major concern would seem to be with invasion of privacy or infringement of the rights of the individual. The author expresses the same concern with maintaining flexibility. How this is to be achieved is a legal problem in large part. I would agree with him that there might be a time when the drug has been demonstrated to be sufficiently dangerous to require criminal sanctions against possession. I believe that time has now come.

Factors influencing the dominant cultural attitudes

Ideally if not in actuality the dominant cultural attitude is that each member of society is to be held fully accountable for his actions; that he must contribute to the fullest extent of which he is capable by production of some useful goods or service; and that both pleasures and relief of physical or psychological pain shall conform to a puristic norm. LSD—an exotic device to begin with—is unacceptable on all scores since the persons taking it become so sufficiently dissociated that they cannot be regarded as responsible for their actions; in point of fact they become quite unproductive even though they feel otherwise, and are also relieved of feelings of guilt and responsibility in an unconventional manner.

Factors influencing the dissenting minority

Separate factors influencing the strongest position of the dissenting minority are based upon dissatisfaction with the status quo and the possibility that LSD may open new pathways for exploration of the nature of the self and its potentialities in the evolution of superior value systems. There is evidence that dissociating drugs such as soma (possibly *amanita muscaria*) are referred to in the Rig-veda and in all probability date back to even prehistoric times. Certainly the Eleusinian mysteries, the sect of the Assassins, the Witches' Sabbaths and others made use of similar dissociating drugs.

Conclusion

How and to what extent these drugs are useful agents of social transformation has never been clearly determined. Certainly any

society which used them on a large scale would be courting extinction. Use must be restricted either by the exclusiveness of the groups using them or by legal prohibition. Since those utilizing the drugs are seeking popularity rather than exclusiveness there seems to be no choice but to have prohibition in spite of the fact that some might argue that limited usage would be highly desirable.

A proposal

Rather than depend solely on criminal sanctions, it is proposed that anyone, demonstrated to have used LSD or suspected of being under its influence by reason of his behavior, be placed in protective custody until an adequate psychiatric examination can be carried out. This would generally make it possible to determine:

1. If the individual was sane before taking the drug.
2. If he is still under the influence of LSD.
3. If he is suffering from a relapse after an interval of clarity.
4. If he is in need of a drug such as chlorpromazine to terminate an episode.
5. If adequate precautions have been observed to minimize the possibility of an unexpected recurrence.

Until examination had clarified these points the patient should be protected against becoming a menace to himself or others. Some day there will probably be an inexpensive and rapid technique for chemically determining the presence of LSD in the blood or urine but that day is not yet in sight and management of the user cannot be posited on the possibility of such a discovery. There should however be enough flexibility in whatever laws are made to make it possible to adjust should the possibility become a reality. Until that time the disadvantages of such a procedure are far outweighed by the benefits to be gained both by the LSD user himself, those intimately associated with him (including potential offspring) and the society in which he exists.